WA 6819
9/18/01
1b

DISCOVERY REPORT

18 September 2001

Boeing Plant 2 South Yard
Transformer Pad

Background

A transformer pad supporting three large transformers is located in the southern portion of Boeing's Plant 2 Facility (see Figure 1). The transformer pad is located south of the former 2-72 Building adjacent to the Plant 2 Facility property boundary (see Figure 2).

The transformers are owned and operated by Seattle City Light. The transformer pad is constructed of concrete and is surrounded by a concrete berm which serves as secondary containment to contain any leakage from the transformers. When new, the transformers were cooled with oil containing polychlorinated biphenyls (PCBs).

Small quantities of oil are visible on the outside of the transformers. There are also visual signs that oil may have leaked onto the transformer pad over its years of operation. The transformers have supplied power to the Plant 2 facility for many years.

Discovery Events

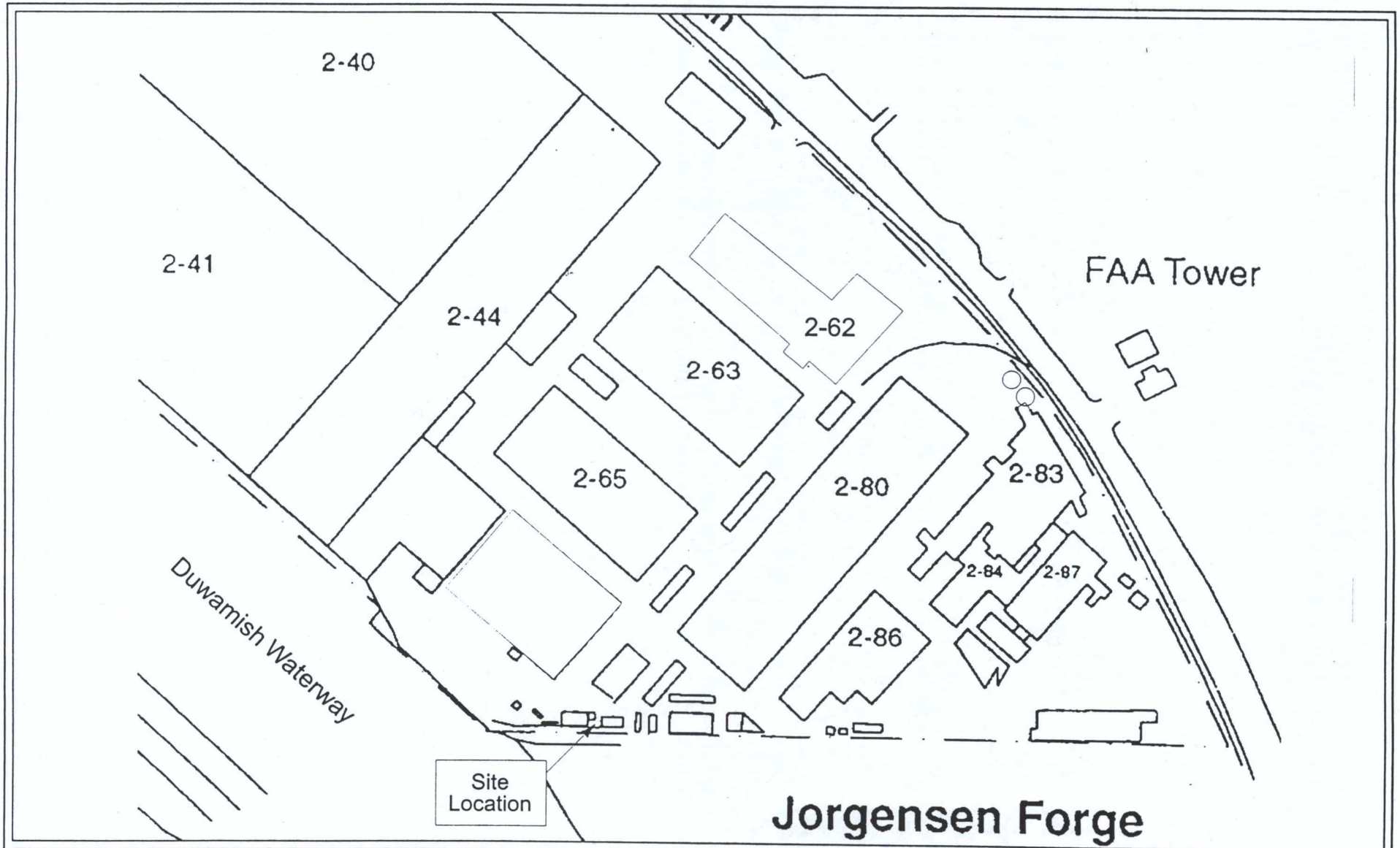
Boeing is in the process of replacing the secondary containment curbing. Concrete removal and incidental soil excavation were performed on August 8, 2001 along the west side of the pad adjacent to the property line. A fine sandy silt layer (approximately 8 inches in thickness) was encountered at a depth of 10 to 18 inches below the ground surface. The fine sandy silt layer had a hydrocarbon odor and appeared to be stained. Silty sand was present below the sandy silt layer. The silty sand had no odor or staining.

Soil samples were collected from eight locations in the stained sandy silt and underlying silty sand and were submitted to an analytical laboratory for polychlorinated biphenyls (PCBs) analysis. Samples were collected from approximate depths of 1 to 3 inches in each sidewall and from 6 inches below the bottom of the excavation. Analytical data indicated that soil within the excavation contains PCBs. PCB concentrations ranged from 460,000 ug/kg to not detected at a detection limit of 37 ug/kg. The highest PCB concentrations were found in the sandy silt layer in the west sidewall along the Plant 2 property line.

To confirm the presence of PCBs, soil was resampled from the excavation on August 15, 2001. The same locations within the excavation were sampled; however, sidewall samples were collected 5 to 6 inches further into the sidewalls and the sample from the excavation bottom was collected 1 foot below the excavation bottom. PCBs were detected at three of the eight sampling locations, as compared to seven of eight in the first sample group. Where detected, the PCBs concentrations ranged from 93 to 300,000 ug/kg. Detection limits where PCBs were not detected ranged from 36 to 110 ug/kg. Figure 3 shows the excavation, sample locations, and PCB

analytical results. Laboratory data reports and data validation memoranda (by WESTON) are attached to this report.

In summary, PCBs-contaminated soil was discovered adjacent to a transformer pad containing transformers that were historically filled with PCBs-containing oil. Both the concrete pad and the transformers exhibit evidence of oil leakage. Based on these observations, it is likely that the PCBs detected in the soil originated from the transformers.



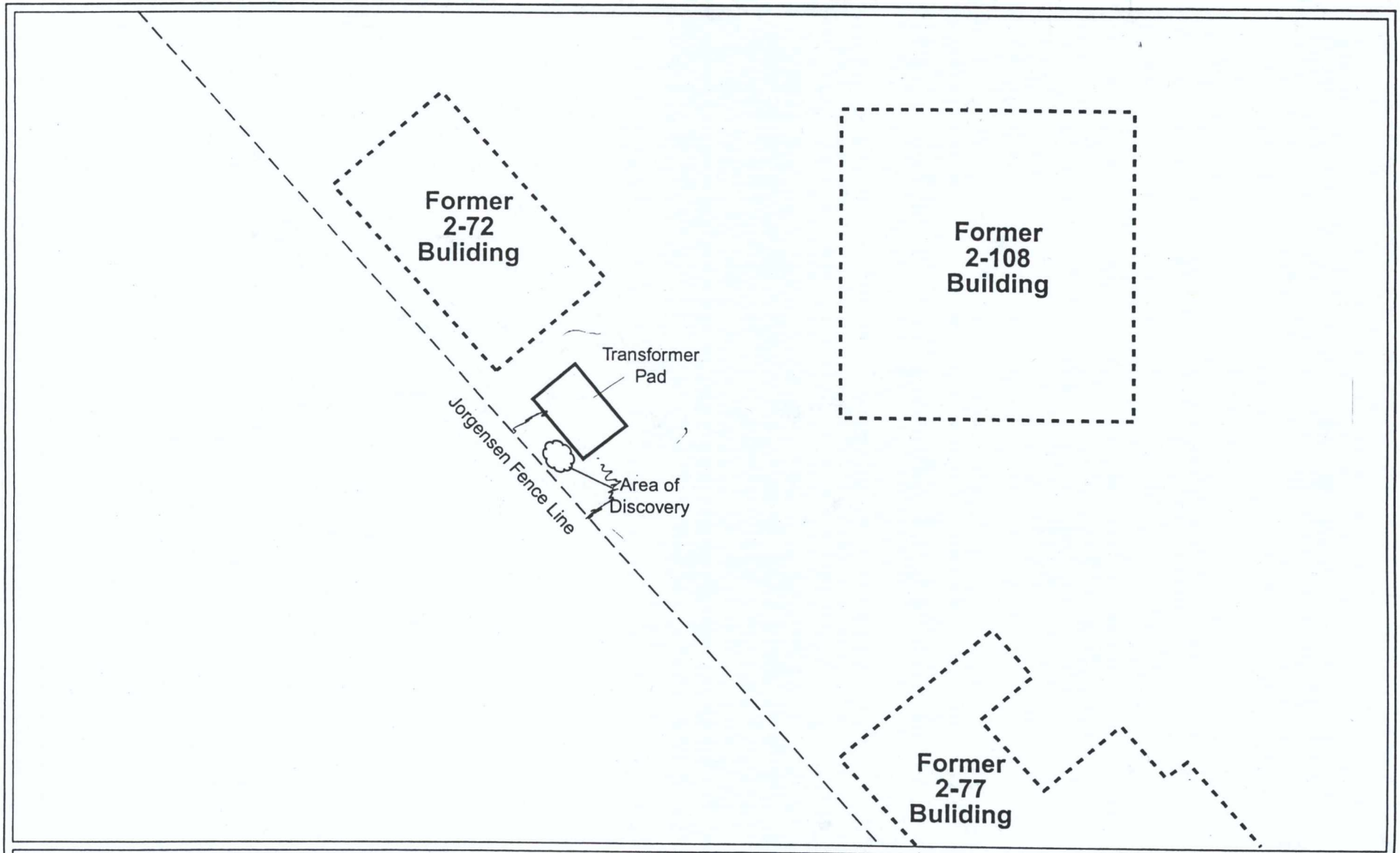
Not to Scale

WESTON
MANAGERS DESIGNERS/CONSULTANTS

Boeing Plant 2
Transformer Pad Site Location

Figure
1

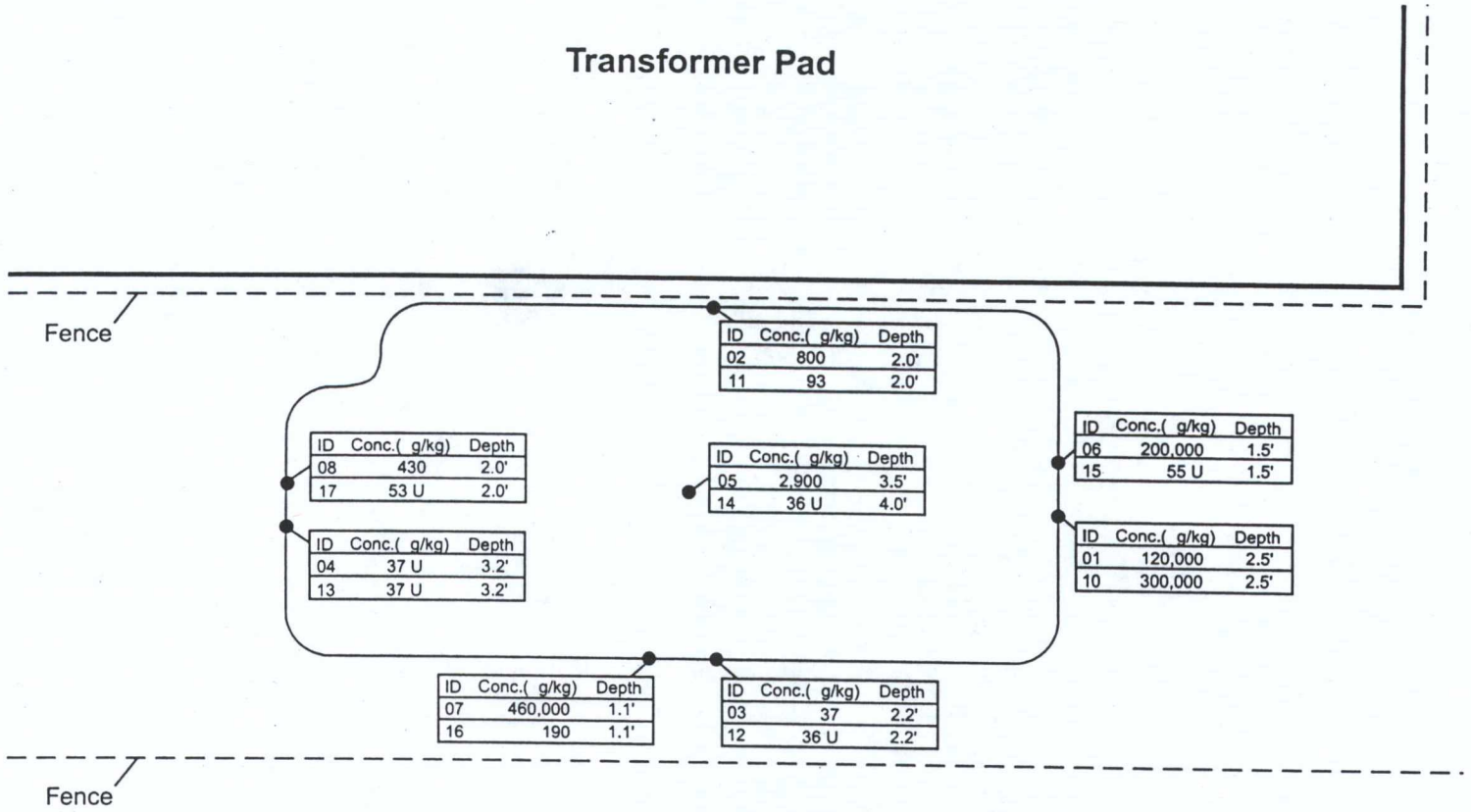
01-0262 Fig1.ai



Boeing Plant 2
Transformer Pad Site Details

Figure
2

01-0262 Fig2.ai



0 1.5 3

Scale in Feet

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Notes:
1. PCBs concentration shown.
2. Samples 01 through 04 and 06 through 08 were collected from depths of 1 to 3 inches in the excavation sidewalls.
3. Samples 10 through 13 and 15 through 17 were collected from depths of 6 to 9 inches in the excavation sidewalls.
4. Samples 05 and 14 were collected from the excavation bottom.
5. U=Undetected at detection limit shown.

Boeing Plant 2
Excavation Details

Figure
3

01-0262 Fig3.ai

PLANT 2 – TRANSFORMER PAD EXCAVATION
DATA VALIDATION QA/QC REVIEW

Nine soil samples collected August 8, 2001, as part of the Transformer Pad Excavation Sampling at Boeing's Plant 2 Complex, were analyzed for polychlorinated biphenyls (PCB).

Samples were analyzed by Analytical Resources Incorporated of Seattle, Washington in accordance with procedures described in *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (USEPA SW-846, 3rd edition). Samples were analyzed and results reported by the laboratory as batch number **DL55**. The following samples were analyzed:

SG-08101-0025	**SG-08102-0020**	**SG-08103-0022**	**SG-08104-0032**
SG-08105-0035	**SG-08106-0015**	**SG-08107-0011**	**SG-08108-0020**
SG-08108-1020			

Quality assurance/quality control (QA/QC) reviews of laboratory procedures were performed on an ongoing basis by the laboratory. A data review was performed on laboratory quality control results summary sheets to ensure they met data quality objectives for the project. Data review followed the format outlined in the Laboratory Data Functional Guidelines for Evaluating Organic Analyses (EPA 1999) modified to include specific criteria of the individual analytical methods. Raw laboratory data including calibrations, sample login forms, sample preparation logs and bench sheets, quantitation reports, mass spectra, and chromatograms are kept on file at the laboratory.

POLYCHLORINATED BIPHENYLS

Analytical Methods - *acceptable*

Samples for PCB analysis were analyzed referencing by gas chromatography/electron capture detection utilizing EPA SW846 Method 8082.

Sample Holding Times - *acceptable*

All samples were extracted and analyzed within two days for this rush job. All holding time criteria were met.

Laboratory Reporting Limits

The laboratory achieved specified reporting limits for all analytes except those in samples SG-08106-0015 and SG-08107-0011; which were analyzed at dilution in order to bring the analyte responses within the calibration range of the instrument. The diluted sample reporting limits

N - Tentative identification. The analyte exhibits low spectral match parameters but, based on the analyst's or reviewer's judgment, is present. The chromatogram of the sample did not match that of the requested product.

H - Holding times have been exceeded. Results and quantitation limits may be biased low (with the exception of low-level mercury).

E - Concentration exceeded the instrument calibration range. Results may be biased low. Sample dilution and reanalysis are required to verify concentration.

D - Value was obtained from reanalysis of a diluted sample.

I - Results or quantitation limit are elevated due to analytical interference

Data Assessment

Data review was performed by an experienced quality assurance chemist independent of the analytical laboratory and not directly involved in the project.

This is to certify that I have examined the analytical data and based on the information provided to me by the laboratory, in my professional judgement the data are acceptable for use except where by data qualifiers, which modify the usefulness of those individual values.

R Paul Swift. 09/12/2001

R. Paul Swift, Ph.D. Date
Chief Chemist

Analytical Resources, Incorporated
Analytical Chemists and Consultants

13 August 2001

Rudy Rogers
The Boeing Company
Energy and Environmental Affairs
P.O. Box 3707, M/S 1W-12
Seattle, WA 98124-2207

RE: Transformer Pad Excavation / 03709-0
ARI Job DL55

Dear Rudy,

Please find enclosed the original chain of custody (COC) record and analytical results for the project referenced above. Analytical Resources, Inc. accepted nine soil samples in good condition on August 8, 2001.

The samples were analyzed for PCBs referencing EPA method 8082.

No analytical complications were noted.

Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
ANALYTICAL RESOURCES, INC.

Stephanie Lucas
Project Manager
(206) 389-6154
steph@arilabs.com

Enclosures

cc: Paul Swift, Roy F. Weston, Inc., Seattle

SL/mdh

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: DL55MB
LIMS ID: 01-13430
Matrix: Soil

Data Release Authorized: CH 9/19/1
Reported: 08/10/01

QC Report No: DL55-Boeing Plant II
Project: Transformer Pad Excavation 03709-0
Date Sampled: NA
Date Received: NA

Date extracted: 08/09/01
Date analyzed: 08/09/01 23:01
Instrument ID: ECD3
Sample Amount: 5.00 g-dry-wt
Final Ext Vol: 40 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	800 U
53469-21-9	Aroclor 1242	800 U
12672-29-6	Aroclor 1248	800 U
11097-69-1	Aroclor 1254	800 U
11096-82-5	Aroclor 1260	800 U
11104-28-2	Aroclor 1221	1,600 U
11141-16-5	Aroclor 1232	800 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	104%
Tetrachlorometaxylene	100%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

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AUG 20 2001

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: SG-08101-0025

Lab Sample ID: DL55A
LIMS ID: 01-13430
Matrix: Soil

Data Release Authorized:
Reported: 08/10/01

QC Report No: DL55-Boeing Plant II
Project: Transformer Pad Excavation 03709-0
Date Sampled: 08/08/01
Date Received: 08/09/01

Date extracted: 08/09/01
Date analyzed: 08/10/01 00:47
Instrument ID: ECD3
Sample Amount: 4.60 g-dry-wt
Final Ext Vol: 40 mL
pH: 7.0

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:10
Percent Moisture: 8.1 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	8,700 U
53469-21-9	Aroclor 1242	8,700 U
12672-29-6	Aroclor 1248	8,700 U
11097-69-1	Aroclor 1254	8,700 U
11096-82-5	**Aroclor 1260**	**120,000**
11104-28-2	Aroclor 1221	17,000 U
11141-16-5	Aroclor 1232	8,700 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	135%
Tetrachlorometaxylene	105%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
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NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

AUG 20 2001

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: SG-08103-0022

Lab Sample ID: DL55C
LIMS ID: 01-13432
Matrix: Soil

Data Release Authorized: CLK
Reported: 08/10/01 8/10/1

QC Report No: DL55-Boeing Plant II
Project: Transformer Pad Excavation 03709-0
Date Sampled: 08/08/01
Date Received: 08/09/01

Date extracted: 08/09/01
Date analyzed: 08/09/01 17:44
Instrument ID: ECD3
Sample Amount: 11.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.6

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 8.4 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	Aroclor 1248	36 U
11097-69-1	Aroclor 1254	36 U
11096-82-5	**Aroclor 1260**	**37**
11104-28-2	Aroclor 1221	73 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	82.8%
Tetrachlorometaxylene	69.2%

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Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: SG-08105-0035

Lab Sample ID: DL55E
LIMS ID: 01-13434
Matrix: Soil

QC Report No: DL55-Boeing Plant II
Project: Transformer Pad Excavation 03709-0
Date Sampled: 08/08/01
Date Received: 08/09/01

Data Release Authorized: clt 8/10/1
Reported: 08/10/01

Date extracted: 08/09/01
Date analyzed: 08/09/01 19:30
Instrument ID: ECD3
Sample Amount: 11.1 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.1

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:5
Percent Moisture: 7.1 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	180 U
53469-21-9	Aroclor 1242	180 U
12672-29-6	Aroclor 1248	180 U
11097-69-1	Aroclor 1254	180 U
11096-82-5	**Aroclor 1260**	**2,900**
11104-28-2	Aroclor 1221	360 U
11141-16-5	Aroclor 1232	180 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	102%
Tetrachlorometaxylene	80.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

B

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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: SG-08106-0015
DILUTION

Lab Sample ID: DL55FDL
LIMS ID: 01-13435
Matrix: Soil

QC Report No: DL55-Boeing Plant II
Project: Transformer Pad Excavation 03709-0
Date Sampled: 08/08/01
Date Received: 08/09/01

Data Release Authorized: CLK 9/10/01
Reported: 08/10/01

Date extracted: 08/09/01
Date analyzed: 08/10/01 02:32
Instrument ID: ECD3
Sample Amount: 3.75 g-dry-wt
Final Ext Vol: 40 mL
pH: 6.6

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:20
Percent Moisture: 25.5%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	21,000 U
53469-21-9	Aroclor 1242	21,000 U
12672-29-6	Aroclor 1248	21,000 U
11097-69-1	Aroclor 1254	21,000 U
11096-82-5	**Aroclor 1260**	**200,000**
11104-28-2	Aroclor 1221	43,000 U
11141-16-5	Aroclor 1232	21,000 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	D
Tetrachlorometaxylene	D

Data Qualifiers

J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
S	Indicates no value reported due to saturation of the detector.
D	Indicates the surrogate was diluted out.
U	Indicates compound was analyzed for, but not detected at the given detection limit.
B	Found in associated method blank
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.
NV	Indicates no value reportable - see additional analyses.
Y	Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: SG-08107-0011
DILUTION

Lab Sample ID: DL55GDL
LIMS ID: 01-13436
Matrix: Soil

QC Report No: DL55-Boeing Plant II
Project: Transformer Pad Excavation
03709-0
Date Sampled: 08/08/01
Date Received: 08/09/01

Data Release Authorized: CH
Reported: 08/10/01 9/10/1

Date extracted: 08/09/01
Date analyzed: 08/10/01 06:03
Instrument ID: ECD3
Sample Amount: 3.47 g-dry-wt
Final Ext Vol: 40 mL
pH: 6.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:20
Percent Moisture: 30.8%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	23,000 U
53469-21-9	Aroclor 1242	23,000 U
12672-29-6	Aroclor 1248	23,000 U
11097-69-1	Aroclor 1254	23,000 U
11096-82-5	**Aroclor 1260**	**460,000**
11104-28-2	Aroclor 1221	46,000 U
11141-16-5	Aroclor 1232	23,000 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	D
Tetrachlorometaxylene	D

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: SG-08108-1020

Lab Sample ID: DL55I
LIMS ID: 01-13438
Matrix: Soil

QC Report No: DL55-Boeing Plant II
Project: Transformer Pad Excavation 03709-0
Date Sampled: 08/08/01
Date Received: 08/09/01

Data Release Authorized: (11 8/10/1
Reported: 08/10/01

Date extracted: 08/09/01
Date analyzed: 08/10/01 01:57
Instrument ID: ECD3
Sample Amount: 7.63 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 6.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 36.6%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	52 U
53469-21-9	Aroclor 1242	52 U
12672-29-6	Aroclor 1248	52 U
11097-69-1	Aroclor 1254	52 U
11096-82-5	**Aroclor 1260**	**120**
11104-28-2	Aroclor 1221	100 U
11141-16-5	Aroclor 1232	52 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	79.2%
Tetrachlorometaxylene	74.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

B

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ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: DL55
LIMS ID: 01-13431
Matrix: Soil

QC Report No: DL55-Boeing Plant II
Project: Transformer Pad Excavation
03709-0

Data Release Authorized: JH 8/10/1
Reported: 08/10/01

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 08/09/01

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	275	333	82.5%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	99.2%
Tetrachlorometaxylene	81.0%

Values Reported in Total ug/kg Dry Weight

B

AUG 20 2001

PLANT 2 TRANSFORMER PAD EXCAVATION
DATA VALIDATION QA/QC REVIEW

INTRODUCTION

Eight soil samples were collected from the Transformer Pad Excavation at the Plant 2 Complex on 15 August 2001. The samples were analyzed for polychlorinated biphenyls (PCB) referencing SW846 Method 8082.

Samples were analyzed by Analytical Resources Incorporated of Seattle, Washington in accordance with procedures described in *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (USEPA SW-846, 3rd edition). Sample results were analyzed and reported by the laboratory with the batch number **DM36**. The following samples were analyzed:

SG-08110-0025	SG-08111-0020	SG-08112-0022	SG-08113-0032
SG-08114-0040	SG-08115-0015	SG-08116-0011	SG-08117-0020

Quality assurance/quality control (QA/QC) reviews of laboratory procedures were performed on an ongoing basis by the laboratory. A data review was performed on laboratory quality control results summary sheets to ensure they met data quality objectives for the project. Data review followed the format outlined in the National Functional Guidelines for Organic Data Review (EPA 1999) modified to include specific criteria of the individual analytical methods. Raw laboratory data including calibrations, sample login forms, sample preparation logs and bench sheets, quantitation reports, mass spectra, and chromatograms are kept on file at the laboratory.

Results of the data reviews, organized by analysis class, follow.

POLYCHLORINATED BIPHENYLS (PCBS)

Analytical Methods - *acceptable*

Samples for PCB analysis were prepared using EPA Method 3540, soxhlet extraction of soils, and were analyzed by gas chromatography/electron capture detection utilizing EPA Method 8082.

Sample Holding Times - *acceptable*

All samples were prepared and analyzed within holding time limits of 14 days for extraction / 40 days for analysis of soil samples.

Laboratory Detection Limits - *acceptable*

The laboratory achieved specified detection limits.

I - Results or quantitation limit are elevated due to analytical interference

DATA ASSESSMENT

Data review was performed by an experienced quality assurance chemist independent of the analytical laboratory and not directly involved in the project.

This is to certify that I have examined the analytical data and based on the information provided to me by the laboratory, in my professional judgment the data are acceptable for use except where qualified with qualifiers which modify the usefulness of those individual values.

R. Paul Swift, Ph.D.
Chief Chemist

09/12/2001
Date

DM3C 01-13922 to 01-13929

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Page 1 of 1

Turn Around Requested: Rush - 24hrs

Rudy Rodgers/Boeing

Report to: Paul Swift	Proj Name: Transf. Pad EXC
Company: WESTON	Proj Number: 03709-034-600-0001-01
Address: 190 Queen Anne Ave N, Ste 200, Seattle WA 98109	Sampler: Dave Dinkuhn
Phone: (206) 521-7600	Shipping Method: Deliv.
Fax: (206) 521-7601	AirBill:

Analyses Requested: PCBs 8082

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	PCBs 8082
SG-08110-0025	8/15/01	1210	Soil	1	X
SG-08111-0020	↓	1220	↓	↓	X
SG-08112-0022	↓	1225	↓	↓	X
SG-08113-0032	↓	1230	↓	↓	X
SG-08114-0040	↓	1235	↓	↓	X
SG-08115-0015	↓	1240	↓	↓	X
SG-08116-0011	↓	1245	↓	↓	X
SG-08117-0020	↓	1250	↓	↓	X

Notes/Comments: Samples Unpres.

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)
[signature]		
Printed name: David Dinkuhn	Printed name:	Printed name:
Company: WESTON	Company:	Company:
Date: 8/15/01 Time: 1530	Date: Time:	Date: Time:

Received by:	Received by:	Received by:
[signature]		
Printed name: E Jesthi	Printed name:	Printed name:
Company: ARI	Company:	Company:
Date: 8/15/01 Time: 1530	Date: Time:	Date: Time:

Special Instructions/Notes: email results to dinkuhnd@mail.rfweston.com & daniel.d.machut@boeing.com

Number of Coolers:
Cooler Temp(s):
COC Seals Intact?
Bottles Intact?

ANALYTICAL RESOURCES INCORPORATED

SOIL AROCLOR SURROGATE SUMMARY

Matrix: Soil

QC Report No: DM36
Project: Transf. Pad EXC
03709-034-600-0001-04

LIMS ID	Lab ID	Client ID	TCMX	#	DCBP	#	TOT OUT
01-13922MB	081601MB	Method Blank	99.5%		106%		0
01-13922SB	081601SB	Lab Control	102%		108%		0
01-13922	DM36A	SG-08110-0025	110%		150%	*	1
01-13923MB	081601MB	Method Blank	70.2%		92.0%		0
01-13923SB	081601SB	Lab Control	72.8%		93.2%		0
01-13923	DM36B	SG-08111-0020	73.5%		87.0%		0
01-13924	DM36C	SG-08112-0022	65.0%		85.0%		0
01-13925	DM36D	SG-08113-0032	69.0%		87.2%		0
01-13926	DM36E	SG-08114-0040	70.2%		87.8%		0
01-13927	DM36F	SG-08115-0015	59.5%		69.8%		0
01-13928	DM36G	SG-08116-0011	59.2%		67.5%		0
01-13929	DM36H	SG-08117-0020	61.2%		71.8%		0

	LCS/MB LIMITS	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(46-132)	(34-128)
(DCBP) = Decachlorobiphenyl	(61-122)	(39-132)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

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FORM-II PCB

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: SG-08111-0020

Lab Sample ID: DM36B
LIMS ID: 01-13923
Matrix: Soil

Data Release Authorized: CK 9/12/1
Reported: 08/20/01

QC Report No: DM36-Boeing Plant II
Project: Transf. Pad EXC
03709-034-600-0001-04
Date Sampled: 08/15/01
Date Received: 08/15/01

Date extracted: 08/16/01
Date analyzed: 08/17/01 15:56
Instrument ID: ECD3
Sample Amount: 10.3 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.0

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 14.2%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	39 U
53469-21-9	Aroclor 1242	39 U
12672-29-6	Aroclor 1248	39 U
11097-69-1	**Aroclor 1254**	**50**
11096-82-5	**Aroclor 1260**	**43**
11104-28-2	Aroclor 1221	78 U
11141-16-5	Aroclor 1232	39 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	87.0%
Tetrachlorometaxylene	73.5%

Data Qualifiers

J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
S	Indicates no value reported due to saturation of the detector.
D	Indicates the surrogate was diluted out.
U	Indicates compound was analyzed for, but not detected at the given detection limit.
B	Found in associated method blank
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.
NV	Indicates no value reportable - see additional analyses.
Y	Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

B

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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: SG-08113-0032

Lab Sample ID: DM36D
LIMS ID: 01-13925
Matrix: Soil

Data Release Authorized: CH
Reported: 08/20/01 8/21/01

QC Report No: DM36-Boeing Plant II
Project: Transf. Pad EXC
03709-034-600-0001-04
Date Sampled: 08/15/01
Date Received: 08/15/01

Date extracted: 08/16/01
Date analyzed: 08/17/01 20:22
Instrument ID: ECD3
Sample Amount: 10.7 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 10.6%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	37 U
53469-21-9	Aroclor 1242	37 U
12672-29-6	Aroclor 1248	37 U
11097-69-1	Aroclor 1254	37 U
11096-82-5	Aroclor 1260	37 U
11104-28-2	Aroclor 1221	74 U
11141-16-5	Aroclor 1232	37 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	87.2%
Tetrachlorometaxylene	69.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

B

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B

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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: SG-08115-0015

Lab Sample ID: DM36F
LIMS ID: 01-13927
Matrix: Soil

Data Release Authorized: [signature]
Reported: 08/20/01

QC Report No: DM36-Boeing Plant II
Project: Transf. Pad EXC
03709-034-600-0001-04
Date Sampled: 08/15/01
Date Received: 08/15/01

Date extracted: 08/16/01
Date analyzed: 08/17/01 21:32
Instrument ID: ECD3
Sample Amount: 7.27 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 6.9

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 39.7%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	55 U
53469-21-9	Aroclor 1242	55 U
12672-29-6	Aroclor 1248	55 U
11097-69-1	Aroclor 1254	55 U
11096-82-5	Aroclor 1260	55 U
11104-28-2	Aroclor 1221	110 U
11141-16-5	Aroclor 1232	55 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	69.8%
Tetrachlorometaxylene	59.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: SG-08117-0020

Lab Sample ID: DM36H
LIMS ID: 01-13929
Matrix: Soil

Data Release Authorized: CH 9/12/01
Reported: 08/20/01

QC Report No: DM36-Boeing Plant II
Project: Transf. Pad EXC
03709-034-600-0001-04
Date Sampled: 08/15/01
Date Received: 08/15/01

Date extracted: 08/16/01
Date analyzed: 08/17/01 23:18
Instrument ID: ECD3
Sample Amount: 7.59 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.1

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 36.9%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	53 U
53469-21-9	Aroclor 1242	53 U
12672-29-6	Aroclor 1248	53 U
11097-69-1	Aroclor 1254	53 U
11096-82-5	Aroclor 1260	53 U
11104-28-2	Aroclor 1221	100 U
11141-16-5	Aroclor 1232	53 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	71.8%
Tetrachlorometaxylene	61.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

B

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ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: DM36
LIMS ID: 01-13922
Matrix: Soil

QC Report No: DM36-Boeing Plant II
Project: Transf. Pad EXC
03709-034-600-0001-04

Data Release Authorized: [signature]
Reported: 08/20/01

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 08/16/01

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	7840	8000	98.0%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	108%
Tetrachlorometaxylene	102%

Values Reported in Total ug/kg Dry Weight

[signature]
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ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: DM36
LIMS ID: 01-13923
Matrix: Soil

QC Report No: DM36-Boeing Plant II
Project: Transf. Pad EXC
03709-034-600-0001-04

Data Release Authorized: CLB
Reported: 08/20/01

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 08/16/01

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	265	333	79.5%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	93.2%
Tetrachlorometaxylene	72.8%

Values Reported in Total ug/kg Dry Weight

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